N° 22,594 A.D. 1910

*Date of Application, 29th Sept., 1910—Accepted, 15th Dec., 1910*

COMPLETE SPECIFICATION.

# Improvements in Electric Detonators for Submarine Blasting Purposes.

We, CURTISS & HARVEY, LIMITED, of 3, Gracechurch Street, in the City of London, Explosives Manufacturers, and CLEMENT LEIGH WATSON SMITH, of the same address, a Director of the said Company, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

In the manufacture of electric detonators for submarine purposes great difficulty has hitherto been experienced in making a perfectly waterproof joint between the detonator and the electric conducting wires, the various cements used having been either too hard with a tendency to crack and admit the water, or—if a more plastic cement is used—there is a danger of its remaining sticky, and detonators so cemented often become useless especially in warm weather.

To overcome this difficulty we now attach our detonators to the electric wires in the following manner, when they are to be used for submarine purposes. The accompanying drawing illustrates the invention to an enlarged scale.

The insulated wires are as heretofore attached to the paper tube *a* containing the electrical firing device (which may be either high or low tension as preferred) the paper tube is inserted in the detonator tube *b* and the upper edge of the latter is firmly crimped round or above the paper tube in the usual manner. and a thick coating of a very plastic and perfectly waterproof cement is applied at the junction of the detonator tube with the electric wires *c*. A small cap of copper or other metal *d* is provided of about $\frac{3}{4}$″ long and made to fit more or less exactly over the detonator tube for about $\frac{2}{3}$rds of the length of the tube *b* but an internal circumferential shoulder *e* is provided to prevent it going beyond a certain distance. The top of the cap is pierced with a hole *f* just large enough to admit the electric wires, care being taken that there is no sharp edge to the metal to damage their insulation. The conducting wires are threaded through this cap which is then firmly pressed down over the end of the detonator tube in such a manner as to squeeze out the surplus quantity of the plastic cement above mentioned which escaped either through the hole in the top of the cap or at its lower edge. Any excess of the cement is then wiped off and the whole of the detonator together with about two inches of the insulated wire is coated with a suitable varnish, a perfectly watertight joint being the result.

By employing a cap as above described we are enabled to produce a strong and rigid electric detonator for submarine purposes which shall be safe and easy to pack, handle and use under any climatic conditions, and at the same time to seal it efficiently with a cement plastic enough to render it perfectly waterproof for an indefinite period. Moreover a submarine detonator as above described is much neater in appearance and being of practically the same diameter throughout and without the usual mass of cement wax *etc.* at its head is more easily inserted in any cartridge of high explosive than those hitherto employed.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. In an electric detonator of the kind specified an outer metallic casing

[*Price 8d.*]

or covering which serves as a cap or closure for the detonator itself substantially as described.

2. A detonator casing substantially as described with reference to the appended drawings.

Dated the 29th day of September, 1910.

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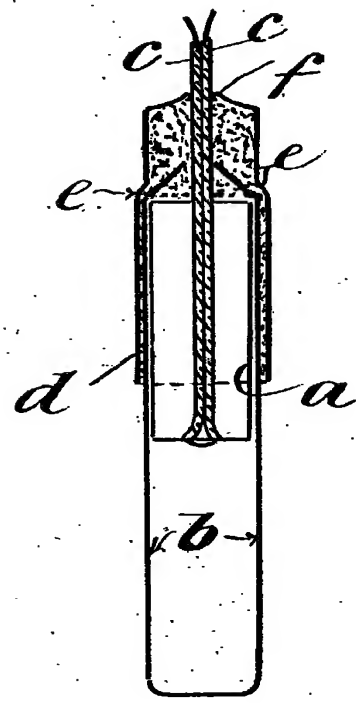
CURTISS & HARVEY [LTD.] & *another's* Complete Specification. *(1 SHEET)*

*[This Drawing is a full-size reproduction of the Original.]*



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